EXECUTIVE SUMMARY

Purpose of This Report

The Annual Site Environmental Report for the West Valley Demonstration Project (WVDP or Project) is published to provide information about environmental conditions at the WVDP to members of the public living near the site and to other interested stakeholders. The WVDP is located in western New York State, about 30 miles (50 kilometers [km]) south of Buffalo, within the New York State-owned Western New York Nuclear Service Center. In accordance with United States (U.S.) Department of Energy (DOE) Order 231.1A, "Environment, Safety, and Health Reporting," this report summarizes calendar year (CY) 2005 environmental monitoring data so as to describe the performance of the WVDP's environmental management system (EMS), confirm compliance with standards and regulations, and highlight important programs. Activities at the WVDP are being conducted in conjunction with the New York State Energy Research and Development Authority.

Major Site Programs

The WVDP is located on the site of a former commercial nuclear fuel reprocessing plant, which was shut down in 1976. In 1980, Public Law 96-368 (the WVDP Act) was passed. This Act authorized the DOE to demonstrate a method for solidifying 600,000 gallons (2.3 million liters) of liquid high-level radioactive waste (HLW) that remained at the West Valley site. Vitrification of the HLW, begun in 1996, was completed in September 2002. Activities for decontaminating the vitrification and support facilities and for managing and disposing of wastes were then initiated and continued through CY 2005. Major activities that occurred in 2005 are described below.

Operation of the Remote-Handled Waste Facility (RHWF). Construction of the RHWF, a facility used to prepare higher-activity wastes for shipment and disposal, was completed in June 2004, and processing of radioactive waste was then initiated. In 2005, approximately 3,250 cubic feet (92 cubic meters) of waste were processed, including four boxes of historical waste from the chemical process cell waste storage area.

Vitrification Facility Dismantlement Project. Dismantlement of the major pieces of equipment in the vitrification cell was completed in July 2005, making the WVDP the first site in the nation to

A reader opinion survey has been inserted in this report. If it is missing, please contact the WVDP Communications Department at (716) 942-2152. Additional Project information is available on the internet at http://www.wv.doe.gov.

design, construct, operate, shut down, and dismantle a full-scale radioactive vitrification system.

Waste Management. Management of HLW, transuranic waste, mixed waste (i.e., waste that is both hazardous and radioactive), low-level radioactive waste (LLW), hazardous waste, and nonhazardous regulated waste continued to be a priority at the WVDP in 2005.

Upgrades were made to facilities and areas on site to support increased preparation of LLW for off-site shipment. More than 300,000 cubic feet (8,500 cubic meters) of LLW were shipped in 2005. About 573 pounds (260 kilograms) of hazardous waste was shipped. No mixed waste was shipped in 2005.

Approximately 280 tons (250 metric tons) of nonradioactive, nonhazardous material were sent off site in 2005, much of which was recycled. Also, about 840 tons (760 metric tons) of digested sludge was shipped from the WVDP's sanitary and industrial wastewater treatment facility to the Buffalo Sewer Authority for disposal.

Infrastructure Reduction. In 2005, the equivalent of 115 temporary office trailer units were removed from service and dismantled or moved off site. Employees were relocated to the Ashford Office Complex or to a few consolidated areas on site.

Reduction of Risks Associated With Radioactive Materials. In November 2005, the DOE approved the downgrade of the WVDP to a Category 3 nuclear facility, marking the first time in the site's history that it has been assigned the least of three DOE nuclear facility designations. The categorization is based upon the amounts, types, and configuration of nuclear materials at the site and their potential risks.

Waste Management Environmental Impact Statement. In June 2005, the DOE issued the Record of Decision (ROD) on the Waste Management Environmental Impact Statement (EIS). This ROD defined management of WVDP LLW and mixed LLW, deferred the decision on management of transuranic wastes, and specified that canisters of vitrified HLW will remain in storage on site until they can be shipped directly to a repository. In 2005, preparation of the Decommissioning and/or Long-Term Stewardship EIS continued.

Key Initiatives

Environmental Performance Indicators. In 2005, management at the WVDP continued efforts to meet goals established for the U.S. Environmental Protection Agency's (EPA) National Environmental Performance Track program for the three-year period of CY 2004–2006. The three goals are: (1) elimination of Halon 1301 from fire-suppression systems on site, (2) a 10% reduction in total energy usage, and (3) a 10% reduction in total radiological curies discharged in wastewater. The first commitment was completed in 2004 and no Halon 1301 remains on site. The second goal was met in 2004 and again in 2005, when energy usage was reduced by about 19%. The third commitment, although met in 2004, was not met in 2005, when curies released in wastewater discharges exceeded the goal by more than 50%. Corrective measures implemented in the latter part of 2005 improved performance. Additional corrective measures are being developed to further assist in meeting this commitment during 2006.

Pollution Prevention/Waste Minimization Goals. In 2005, as part of the site's EMS, a long-term waste minimization and pollution prevention program to promote affirmative procurement and minimize the generation of LLW, mixed waste, hazardous waste, industrial waste, and sanitary

waste continued at the WVDP. The program emphasized good business practices, source reduction, and recycling. Waste minimization goals for generation of waste in three of the five categories (LLW, mixed, and hazardous) were met or exceeded in 2005. Target reduction goals for generation of both industrial waste and sanitary waste (e.g., paper, glass, plastic, wood, and scrap metal) were not met. Activities supporting the site milestones and infrastructure reduction resulted in the generation of quantities of waste that exceeded target goals.

Environmental Management System

The WVDP EMS satisfies the requirements of DOE Order 450.1, "Environmental Protection Program." The WVDP EMS is an integral part of the WVDP Integrated Safety Management System (ISMS). In 2005, WVDP employees continued to demonstrate their commitment to an all-inclusive approach to safety, coordinating the EMS with other safety management and work planning processes through the integrated environmental, health, and safety management program.

Recognition and Awards. In 2005, the WVDP reaffirmed its commitment to the DOE's Voluntary Protection Program (VPP) and was examined as part of the annual ISMS review. VPP Star status is granted in recognition of excellent worker safety and health programs. The DOE recommended recertification of the WVDP as a DOE-VPP Star site in 2005.

By year-end 2005, WVDP employees reached 3.7 million safe work hours and three years without a lost-time work accident. In recognition of this safety record, the WVDP was awarded the Washington Group President's Award for Safety for the third consecutive year.

Compliance. Management at the WVDP continued to provide strong support for environmental compliance in 2005. Requirements and guidance from applicable state and federal statutes, executive orders, DOE orders, and standards are integrated into the Project's compliance program. In CY 2005:

• no notices of violation or inspection findings from any environmental regulatory agencies were received by the WVDP.

• inspections by the New York State Department of Environmental Conservation and the local department of health verified Project compliance with the applicable environmental and health regulations.

• waste management areas at the site were monitored in compliance with the Resource Conservation and Recovery Act §3008(h) Administrative Order on Consent.

• Project representatives met requirements of the Emergency Planning and Community Right-to-Know Act by collecting information about hazardous materials used at the Project and making this information available to the local community.

• no exceedances to State Pollutant Discharge Elimination System (SPDES) permit limits or to the EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) dose standard were noted in 2005.

Environmental Monitoring. As part of the EMS, environmental monitoring was continued on and near the site to detect and evaluate changes in the environment resulting from Project (or pre-Project) activities and to assess the effect of any such changes on the environment or human population. Within the environmental monitoring program, airborne and waterborne effluents were sampled and

environmental surveillance of the site and nearby areas was conducted.

Radiological Releases. In 2005, the WVDP maintained six NESHAP permits for release of airborne emissions. The primary source of airborne radionuclide emissions was the main stack of the process building.

Waterborne releases were from two primary sources: lagoon 3, from which treated water is released in batches, and from a well-characterized seepage on the north plateau of the WVDP that is contaminated with strontium-90 from pre-WVDP operations. Seven batches totaling approximately 13.6 million gallons (51.4 million liters) were discharged from lagoon 3 in 2005. Radiological concentrations and flow from north plateau seepage were closely monitored.

Estimated Dose. In 2005, the estimated dose to a maximally exposed off-site individual (MEOSI) from airborne emissions at the WVDP was 0.0012 mrem (0.000012 mSv), about 0.01% of the 10 mrem NESHAP standard. Estimated dose from waterborne sources in 2005 was about 0.046 mrem (0.00046 mSv), with 0.011 mrem attributable to liquid effluent releases and 0.035 mrem attributable to the north plateau drainage.

Total estimated dose to the MEOSI from both airborne and waterborne sources in 2005 was 0.047 mrem (0.00047 mSv), about 0.05% of the annual 100 mrem DOE standard. In comparison, the typical dose to a member of the public from natural background sources is 295 mrem per year.

Estimated dose to the population within a 50-mile (80-km) radius of the WVDP from DOE activities in 2005 was 0.2 person-rem (0.002 person-Sv). This same population would have received approximately 453,000 person-rem from natural background radiation in 2005.

Dose to Biota. An evaluation of dose to biota for CY 2005, as part of the WVDP environmental monitoring program, resulted in the conclusion that populations of aquatic and terrestrial biota (both plants and animals) are not being exposed to doses in excess of the existing DOE dose standard for aquatic animals and the recommended standards for terrestrial biota.

Nonradiological Releases. Nonradiological releases from Project wastewater were measured under the site's SPDES permit. An updated permit, which added 20 storm water monitoring points to the five existing effluent points, took effect on January 1, 2005. In 2005, no exceedances of any permit limits were noted.

Changes to the Environmental Monitoring Program. An extensive replanning of the monitoring program was conducted in 2005. As a result, numerous modifications were made to maximize the program's efficiency and cost-effectiveness.

Groundwater Monitoring. Monitoring of groundwater at the WVDP continued in 2005, including monitoring of strontium-90 activity in and around the groundwater plume on the north plateau.

Quality Assurance. In 2005, implementation of a quality assurance program for activities supporting the environmental monitoring and groundwater monitoring programs continued at the WVDP. As part of this ongoing effort, on-site and subcontract laboratories that analyze WVDP environmental samples participated in independent radiological and nonradiological constituent performance evaluation studies. In these studies, test environmental samples with concentrations known by the testing agency, but unknown by the laboratory, were analyzed. Of almost 200 performance evaluation analyses conducted by or for the WVDP, more than 97% fell within acceptance limits.

Several inspections, audits, and assessments of components of the environmental monitoring program were conducted in 2005. Although actions were recommended to improve the program, nothing was found that would compromise the data quality in this report or the environmental monitoring program in general.

Conclusion

In addition to demonstrating compliance with environmental regulations and directives, evaluation of data collected in 2005 continued to indicate that WVDP activities pose no threat to public health or safety, or to the environment.

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